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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Matthew Sommers

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EXAMINER

SAWHNEY, HARGOBIND S

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/682,516

Applicant(s)

SOMMERS ET AL.

Examiner

Hargobind S Sawhney

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-15, 18 and 19 is/are rejected.
- 7) ☒ Claim(s) 10, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- * Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- ☐ Interview Summary (PTO-413) Paper No(s) _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 3 is objected to because of the following informalities:

Lines 3 and 4, "light scattered in wide angles, which light is viewable at a wide range of viewing angles" should be rephrased as – said light scattered into wide angles by the microstructures, said light is viewable at a wide range of viewing angles --. This suggested rephrasing would tie the structure – microstructure forming the pattern – with the limitations recited in Claim 2.

Appropriate correction is required.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Claim 15, line 1, "a light emissive face including textured surface; and

Claim 15, lines 6 and 7, "light interacting with the textured surface being emitted from the light emissive face.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1,2,4,7,15,18 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Maas et al (US Patent Publication No.; US2001/0049893 A1).

Regarding claims 1,2,4 and 7, Maas et al. (' 893 A1) discloses a lighting apparatus comprising:

- a wave guide 1 (Figure 1, Para. 0050) having microstructures 7,7', 7'',...; 8,8' 8''(Figure 1A, Para. 0056, lines 1-4) arranged on a surface 3 (Figure 1A, Para. 0056, lines 1-4);
- the microstructures 7,7', 7'',...; 8,8' 8'' interacting with light in a wave guide 1, and scattering at least a portion of the light out of the wave guide in a pattern 27 (Figure 1A, Para. 0056, lines 9-12);
- the pattern 27 being determined by the arrangement of the microstructures 7,7', 7'',...; 8,8' 8'' (Figure 1A, Para. 0058, lines 8-11);
- a plurality of light emitting diodes (LEDs) 5, 5', 5'' (Figure 1A, Para. 0055, lines 1 and 2) coupled to the wave-guide 1 (Figure 1A, Para. 0055, lines 1-3);

- the pattern 27 further including a letter T (Figures 1A, and IB, Para. 0059);
- a cladding including a surface coating (Figure 1A, Para. 0056, lines 12-14) disposed on the surface 3 bearing microstructures 7,7', 7'',...; 8,8' 8'' (Figure 1A, Para. 0058, lines 8-11); and
- the plurality of light emitting diodes (LEDs) 5, 5', 5'' (Figure 1A, Para. 0055, lines 1 and 2) arranged around at least a portion of the perimeter of the planar region 4 (Figure 1A, Para. 50, lines 6-9), and injecting light into the planar region 4 of the wave guide 1.

Regarding Claim 15, Maas et al. (' 893 A1) discloses an alternative embodiment comprising;

- a light emissive face 2 bearing textured surface – herewith a surface bearing deformities (microstructures) is interpreted as a textured surface - (Figure 2 , Para. 0029, lines 8-10);
- a plurality of light producing elements 105,105',105'',...; and 106,106',106'',..., positioned about a portion of the periphery of the light emissive face (Figure 2A, Para. 0060, lines 5-16);
- the light producing elements 105,105',105'',...; and 106,106',106'',..., producing light substantially along an axis perpendicular to the light emissive face – element 1 being an edge lit wave guide - (Figure 2A); and
- light from the light-producing element (105,105',105'',...; and 106,106',106'',...,) interacting with the surface bearing deformities and being emitted from the light emissive face.

Regarding Claim 18, Maas et al. (' 893 A1) further teaches the texture surface of the light emissive face, bearing microstructures (deformities), and forming symbols (not shown, Para. 0025 and 0026). Note: Forming of symbols by microstructures arranged the rear face of the wave-guide could equally be applied on the light emissive face.

Regarding Claim 19, Maas et al. (' 893 A1) further teaches the light emissive face with texture surface of bearing microstructures (deformities), and forming symbols 27 and 28 (not shown, Para. 0025 and 0026) on its interior side – arranged in the central portion - of the light emissive face.

Note: Forming of symbols 27 and 28 by microstructures on the rear face of the wave guide (Figure 1B) could equally be applied on the front light emissive face.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 11,12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Simms et al. (US Patent No.: 5,590,945).

Regarding claims 11,12 and 13, Simms et al. ('945) discloses an optical wave guide being used in conjunction with an associated light source, and comprising:

- a translucent material (Figure 1, column 2, lines 56-58) - a light guide material impregnated with a color dye is being interpreted as a translucent material- formed into a shape10 (Figure 1, column 3, line 21) having a top surface 40 (Figure 1, column 3, line 26), a non-parallel bottom surface 50 (Figure

- 1, column 3, lines 26 and 27), and at least one side surface 20 (Figure 1, column 3, line 23) in optical communication with an associated light source 60 (Figure 1, column 3, lines 39 and 40);
- a plurality of microstructures - ridges – 70 disposed on the rear surface 50 (Figure 1, column 3, lines 46 and 47), and cooperating with the bottom surface 50 in scattering at least a portion of light injected from the associated light source 60;
 - the scattered light exiting the wave guide 10 through the top surface 40 (Figure 1, column 3, lines 55-58);
 - the scattered light forming a pre-selected pattern (not shown, column 2, lines 53-51-57) viewable outside the wave guide; and
 - the plurality of microstructures including a surface roughness formed into the bottom surface 50 – indented in the bottom surface 50 – (Figures 1 and 2).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim is rejected under 35 U.S.C. 103(a) as being unpatentable over Maas et al (US Patent Publication No.; US2001/0049893 A1).

Regarding Claim 3, although, Maas et al. (' 893 A1) does not directly teach the pattern including the light scattered into wide angles by the microstructures; and being viewable at a wide range of viewing angles, he teaches the luminaries applicable for exit signs, bill boards and traffic lights (Para. 0007, lines 2-4; and Para. 0078, lines 1 and 2).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to apply the above-indicated teaching of possible applications requiring the luminaire of Maas et al. (' 893 A1) imparting viewablity at wide range of angles.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maas et al (US Patent Publication No.; US2001/0049893 A1) in view of Tokunaga (US Patent No.: 5,375,043).

Maas et al. (' 893 A1) teaches a wave-guide made of transparent material polymethyle methacrylate (PMMI). However, Maas does not teach the wave-guide Having a pre-selected color tint.

On the other hand, Tokunaga ('043) teaches a lighting unit (Figure 1) comprising a wave-guide 1 (Figure 1, column 2, line 21) being either a colorless or colored transparent plate (Figure 1, column 1, lines 55 and 56; and column 3, lines 33-36).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the wave guide of Maas et al. (' 893 A1) by providing a tinted (smoked) wave guide as taught by Tokunaga ('043) for the benefit and advantage of imparting the desired light transmission properties and attention value.

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10. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maas et al (US Patent Publication No.; US2001/0049893 A1) in view of Yamana et al. (US Patent No.: 5,418,384).

Regarding Claim 6, dependent on Claim 1; and Claim 8, dependent on Claim 7, Maas et al. (' 893 A1) teaches a flat- with no tapered or curved surface - wave-guide. However, Maas et al. (' 893 A1) does not teach a wave guide including a surface having a pre-selected curvature, and the curved surface further bearing microstructure.

Additionally, regarding Claim 8, Maas et al. (' 893 A1) does not a wave-guide being tilted with respect to the planar region.

On the other hand, Yamana et al. ('384) discloses a light source device (Figures 7,9 and 11) comprising a wave-guide 11 (Figure 7, column 4, lines 64 and 65) including a surface 12 having a pre-selected curvature (Figures 9 and 11). Further, a portion f7-f9 of the surface 12 bearing microstructures being tilted (Figures 9 and 11, column 6, lines 46-50).

Thus regarding Claims 6 and 8, it would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the wave guide of Maas et al. (' 893 A1) by providing a the wave guide with pre-selected curvature as taught by Yamana et al. ('384) for the benefit and advantage of providing a wave guide imparting uniformly distributed light output throughout its surface area.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maas et al (US Patent Publication No.; US2001/0049893 A1) in view of Lin et al. (US Patent No.: 6,464,366 B1).

Maas et al. (' 893 A1) does not teach the lighting apparatus comprising an index matching material positioned between the plurality of LEDs and the wave-guide.

On the other hand, Lin et al. ('366 B1) discloses an illumination device 10 (Figure 1, column 5, line 10) comprising an index matching material 20 positioned between a plurality of LEDs 11 and the wave-guide 30 (Figure 1, column 5, lines 34-36).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the wave guide of Maas et al. (' 893 A1) by providing the index matching material as taught by Lin et al. ('366 B1) for the benefit and advantage of improving the local illumination uniformity closes to the light source 11 (Column 5, lines 34-36).

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simms et al. (US Patent No.: 5,590,945) in view of Maas et al (US Patent Publication No.; US2001/0049893 A1).

Regarding Claim 14, Simms et al. ('945) does not teach an optical wave guide including a cladding material disposed on the outside of the bottom surface cooperating with the microstructures scattered.

On the other hand, Maas et al. (' 893 A1) teaches a cladding (Figure 1A, Para. 0056, lines 12-14) disposed on the surface 3 bearing microstructures 7,7', 7'',...; 8,8' 8'' (Figure 1A, Para. 0058, lines 8-11).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the wave guide of Simms et al. ('945) by providing the cladding as

taught by Maas et al. (' 893 A1) for the benefit and advantage of improving light reflection efficiency of the device.

Allowable Subject Matter

13. Claims 10,16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record, including Maas et al (US Patent Publication No.; US2001/0049893 A1) and Yamana et al. (US Patent No.: 5,418,384), does not show or suggest the applicant's invention as claimed. Specifically, the prior art of record does not disclose proper motivation for combining:

- a first sub-set of LEDs emitting a first color of light, a second color of LEDs producing a second color of light, and the second color of light mixing with the first color of light and mixing with the first color of light in a wave-guide to produce a third color as recited in Claim 10;

Note: A combination of a wave-guide with microstructures of pre-determined patterns and mixing of light from different color LEDs within the wave- guide is a unique feature.

- the light emissive face being thicker at its perimeter than at its center as recited in Claim 16;

- an encapsulant surrounding a plurality of light producing elements and abutting a light emissive face as recited in Claim 17; and
- the encapsulant matching a refractive index of the light emissive face as recited in Claim 17.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gwo-Juh et al. (U.S. Patent No. 6,164,791);

Pelka et al. (U.S. Patent No. 6,134,092);

Tung (U.S. Patent No. 5,842,297);

Kanda et al. (U.S. Patent No. 5,664,873);

Hathaway et al. (U.S. Patent No. 5,050,946);

Yamada (U.S. Patent No. 4,965,950); and

Onikiri et al. (Japanese Patent No. JP 411353920 A)

Each of the above-indicated prior arts discloses a lighting apparatus comprising some of the claimed features claimed by the applicant.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hargobind S Sawhney whose telephone number is 703-306-5909. The examiner can normally be reached on 7:30 A.M. to 4:30 P.M.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 703-305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-2956.

HSS
February 20, 2003


Examiner: Hargobind S. Sawhney